

ABSTRACT OF THE DISCLOSURE

A system and a method to remove a layer of high-k dielectric material during the manufacturing of an integrated circuit. In one embodiment of the invention, an etch reactant is employed to form volatile etch products when reacted with high-k layers. Alternately, high-k layers can be anisotropically etched of in accordance with a patterned photoresist or hard mask, where a hyperthermal beam of neutral atoms is used to aid in the reaction of an etch reactant with a high-k layer. Alternately, a hyperthermal beam of neutral atoms or a plasma treatment can be used to modify a high-k layer, and subsequently etch the modified high-k layer utilizing an etch reactant that reacts with the modified high-k layer. In still another embodiment of the invention, the hyperthermal beam of neutral atoms is used to etch a high-k layer through physical bombardment of the high-k layer.